



MachZ Production Announcement

MachZ Version 1.5 Shipping in Production Volume

ZF Linux Devices, Inc. is pleased to announce that the MachZ (Version 1.5) is now shipping in production volume. Customers who have been waiting for production quantities of this revolutionary System-On-A-Chip can rest assured that between our worldwide distribution network and our silicon foundry (National Semiconductor Corporation) MachZ chips will be available to meet all of their future production needs.

Since the product started shipping in small (development) quantities earlier this year we have performed extensive power, temperature and frequency characterization of the production MachZ silicon. This effort produced updated core voltage specifications, power consumption and maximum operating frequency specifications that are detailed below.

Raw Data

Chart 1 summarizes the information collected testing the MachZ at room temperature and plots Core Voltage versus Frequency. The data shows a very linear relationship of the test sample results. Various conclusions have been drawn from this data:

- a) At a core voltage of 2.5 V the maximum frequency for the MachZ is 128MHz. A core voltage of 2.6 V is needed to make the average maximum frequency of the samples reach 133MHz.
- b) For operation below 100MHz a core voltage of 2.25V can be used to further reduce power consumption.

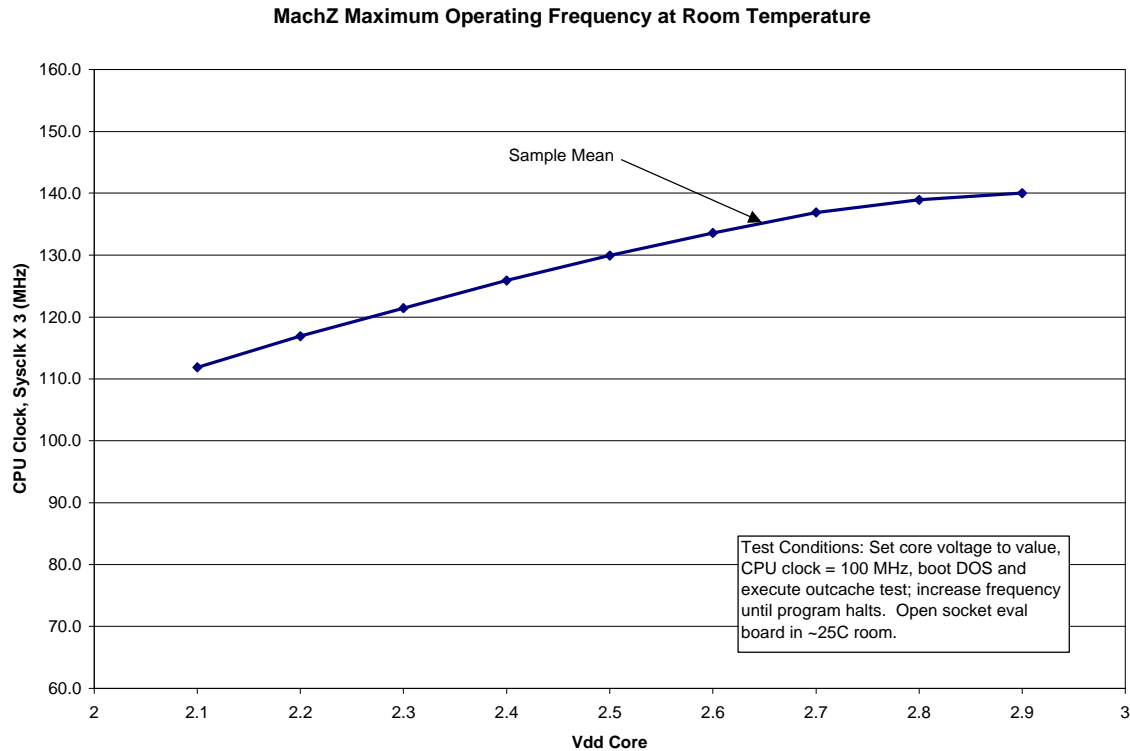


Chart 1: Frequency vs Core Voltage Test Results

MachZ Maximum Operating Frequency over a Temperature Range of 0°C to 70°C

The test data was analyzed using a $\pm 3 \sigma$ criteria to establish the maximum operational frequency limit of the MachZ. This data is shown in chart 2. Using a Mean – 3 σ criteria for each core voltage setting, the population of devices tested result in the following product specifications:

- Operation under 100MHz can be accomplished with a core voltage of $2.25V \pm 5\%$. This allows for a significant power consumption savings vs a core voltage specification of 2.5V
- Maximum operating frequency is 128MHz with a core voltage setting of $2.7V +5\% -2\%$.
- Designers can select a core voltage between 2.25V and 2.7V to run the MachZ at frequencies between 100MHz and 128MHz.

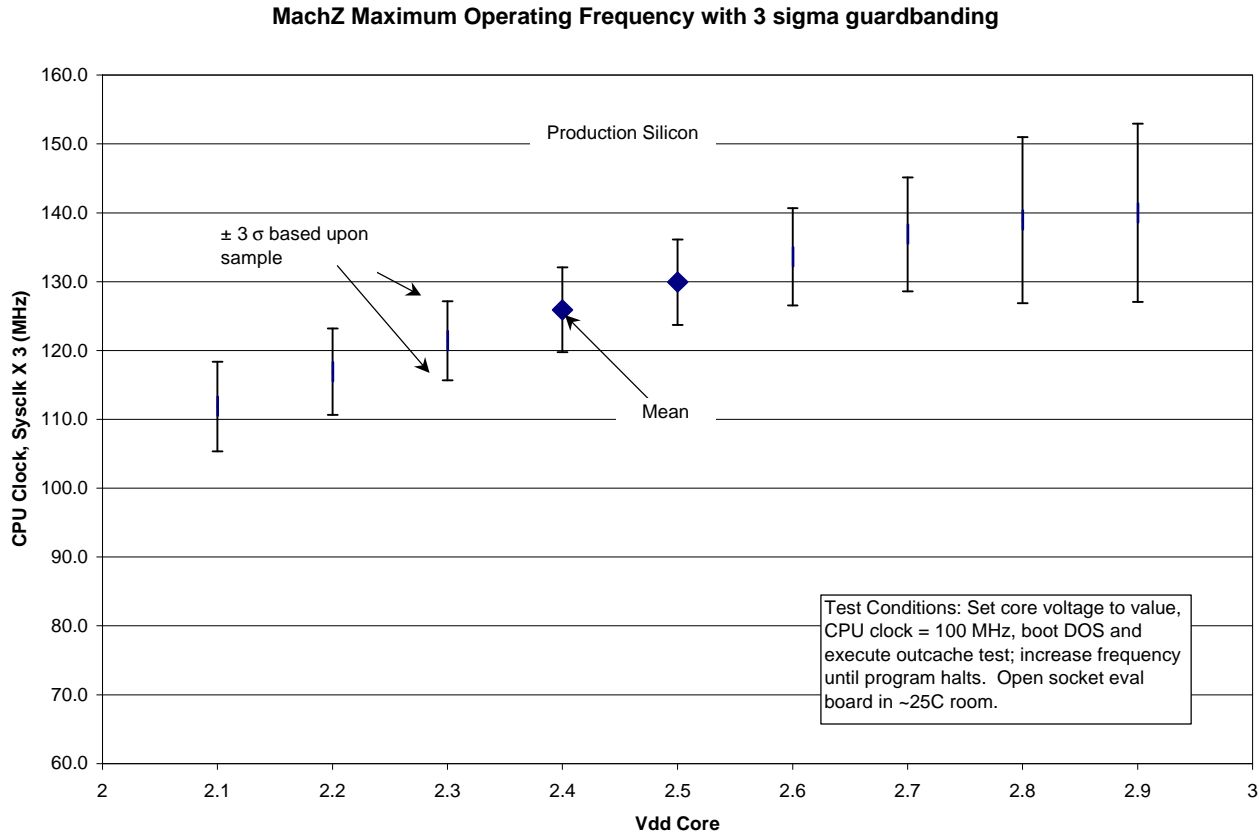


Chart 2: Mean with Guard Banding

MachZ Core Power Consumption

Measurements taken during product characterization show that core power consumption of the MachZ with core voltages set to allow operation of the device (2.25 V and 2.7 V) at various operating frequencies offer customers a choice of power versus performance. Peak Core Power Consumption (mW) readings were taken at frequencies of 33MHz, 66MHz, 100MHz, and 128MHz and are displayed in Table 1.

Table 1 summarizes the core voltage settings required to attain the desired operating frequency and lists the peak power consumption measured at each of these frequencies. This “power throttling” allows the designer to obtain the best power utilization for each unique application.



Core Voltage	Frequency	Peak Core Power Consumption	APM* Core Power Consumption
$2.25 \pm 5\%$	33MHz	$627 \pm 20 \text{ mW}$	$251 \pm 8 \text{ mW}$
$2.25 \pm 5\%$	66MHz	$798 \pm 24 \text{ mW}$	$319 \pm 10 \text{ mW}$
$2.25 \pm 5\%$	100MHz	$956 \pm 28 \text{ mW}$	$382 \pm 11 \text{ mW}$
$2.70 + 5\% - 2\%$	128MHz	$1789 \pm 48 \text{ mW}$	$716 \pm 19 \text{ mW}$

Table 1.

* Calculated core power consumption with APM enabled.

Summary

Complete characterization of MachZ version 1.5 silicon has resulted in the following changes to the MachZ specification.

- The core voltage required to run the device is now a range between 2.25V ($\pm 5\%$) and 2.7V (+5%, -2%). The voltage required is dependent upon the desired operating frequency.
- The maximum operating frequency is 128MHz.

Distributors, manufacturer's representatives and direct sales force personnel please inform our customers immediately about this exciting and informative specification of the production MachZ chip. The MachZ is available in production quantities to meet our embedded OEM's applications now and in the future. Thank you for providing this announcement to the respective designers of embedded prototypes, and encouraging them to get their production orders in to you to meet their scheduled production dates.

Please contact me if you have any questions, 650-965-3800, kweileder@zflinux.com or check our Web site, www.zflinux.com.